## REMARKS

I. Introduction

In response to the Office Action dated September 27, 2005, no claims have been cancelled, amended or added. Claims 1-16, 20-21, 25, 27-29 and 30-32 remain in the application. Re-examination and re-consideration of the application is requested.

II. Prior Art Rejections

A. The Office Action Rejections

In paragraphs (2)-(4) of the Office Action, claims 1, 3, 8, and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Faber, U.S. Patent No. 6,405,052 (Faber) in view of Gustafsson et al., U.S. Patent No. 6,643,275 (Gustafsson). In paragraph (5) of the Office Action, claims 15-16 and 20-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kang, U.S. Patent No. 6,397,043 (Kang) in view of Chen, U.S. Patent No. 5,960,361 (Chen). In paragraph (6) of the Office Action, claims 25, 27-29, and 31-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshida, U.S. Patent No. 4,829,524 (Yoshida) in view of Faber.

However, in paragraph (7) of the Office Action, claims 2, 4-7, 9, and 11-13 were indicated as being allowable if rewritten in independent form to include the base claim and any intervening claims.

Applicants' attorney acknowledges the indication of allowable claims, but respectfully traverses the rejections.

B. The Faber Reference

Faber describes a method for keeping the closed loop adjustment of the transmission power of the mobile station in a CDMA mobile communication system almost constant until the base station succeeds in decoding the first preamble frame without error, thus reducing interference by preventing transmission power overshoot.

C. The Gustafsson Reference

Gustafsson describes an uplink common physical channel (random access channel) frame structure with a separate preamble and data portion. The preamble is used by a base station to detect that a mobile station is attempting a random access request. The data portion of the channel includes user data, and pilot symbols that provide energy for channel estimation during reception of

the data portion. A guard interval is preferably inserted between the preamble and data portion of the frame, which enables data detection to occur during an idle period. As such, the frame structures for both the common physical (random access) uplink channel and dedicated physical (traffic) uplink channel are compatible.

D. The Kang Reference

Kang describes a method for controlling the forward link power independent of reverse link power control. In a mobile communication system where the reverse link is degraded thereby preventing the forward link status to be sent to the base station, the base station estimates the forward link power using power control information received via the reverse link prior to the reverse link being degraded. The forward link is improved using the power control information and once improved the reverse link is improved via the improved forward link.

E. The Chen Reference

Chen describes a method for controlling the forward link power independent of reverse link power control. In a mobile communication system where the reverse link is degraded thereby preventing the forward link status to be sent to the base station, the base station estimates the forward link power using power control information received via the reverse link prior to the reverse link being degraded. The forward link is improved using the power control information and once improved the reverse link is improved via the improved forward link.

F. The Yoshida Reference

Yoshida merely describes a data communication apparatus having a transmitting section to divide data into a plurality of units and transmit the data and a memory section to store the data. This apparatus reads out the data of the designated unit from the memory section in response to a retransmission request signal from the reception side and a signal indicative of the designated unit and then retransmits the readout data from the transmitting section. Thus, even if the transmission error occurs the data can be retransmitted from the corresponding line and the retransmission is efficiently executed.

G. The Applicants' Invention is Patentable Over the References

The Applicants' invention, as recited in claims 1-16, 20-21 and 25-32, is patentable over the references, because Applicants' claims contain limitations not taught by the references.

1. Claims 1-14 are Patentable over Faber and Gustafsson

The Office Action asserts that the combination of Faber and Gustafsson teaches the limitations of claims 1, 3, 8 and 10, at the following locations:

> Faber: Abstract
> A method for keeping the closed loop adjustment of the transmission power of the mobile station in a CDMA mobile communication system almost constant until the base station succeeds in decoding the first preamble frame without error, thus reducing interference by preventing transmission power overshoot.
>
> Faber: Col. 3, line 64 – col. 4, line 34
> The present invention was developed in view of the above-described problems of the prior art and has the object of realizing a closed loop power control method that keeps the closed loop increment of the transmission power of the mobile station almost constant until the base station succeeds to decode the first preamble frame without error. Thus it reduces interference. According to an aspect of the present invention, there is a method of controlling power upon call acquisition in a CDMA mobile communication system for adjusting transmission power to a mobile station by sending a power control adjustment signal from a base station to the mobile station via a forward link, comprising the steps of:
> (a) determining a signal-to-interference ratio and a maximum transmission power level respectively as predetermined first and second thresholds;
> (b) indicating a given power increment per predetermined period;
> (c) measuring a signal-to-interference ratio of a reverse link signal received from the mobile station, comparing the measured signal-to-interference ratio with the first threshold determined in said step (a), and comparing a present transmission power level with the second threshold determined in said step (a);
> (d) not indicating the power increment per said predetermined period if said measured signal-to-interference ratio is greater than said first threshold in said step (c) or if said present transmission power level is greater than said second threshold in said step (c);
> (e) indicating a further power increment per said predetermined period if said measured signal-to-interference ratio is smaller than said first threshold in said step (c) or if said present transmission power level is smaller than said second threshold in said step (c);
> (f) after said step (d) or said step (e), confirming whether a preamble signal from the mobile station is normally decoded, and returning to said step (c) if the preamble signal is not normally decoded; and (g) starting a closed-loop power control algorithm if it is confirmed that the preamble signal is normally decoded in said step (f).

Faber: Col. 8, lines 55-61

If a preamble frame has been decoded without yielding an error S106, the reverse link acquisition closed loop power control ends, and the conventional closed loop power control algorithm, as it is well known in the art, is started S107. This includes the formerly mentioned SIR threshold control by comparing the received BER to a nominal value (outer loop) which is disabled during the steps S100 to S107.

Gustafsson: Col. 5, line 56 – col. 6, line 2

Essentially, in accordance with a preferred embodiment of the present invention, an uplink common physical channel (random access channel) frame structure is provided with a separate preamble and data portion. The preamble is used by the base station to detect that a MS is attempting the random access request. The data portion of the channel includes user data, rate information, and pilot symbols that provide energy for channel estimation during detection of the data portion. A guard interval is preferably inserted between the preamble and data portion of the frame, which enables detection of the preamble before the data arrives (requiring less buffering). As such, the frame structures for both the common physical (random access) uplink channel and dedicated physical (traffic) uplink channel are compatible.

Gustafsson: Col. 6, lines 22-48

As such, the signature pattern for each preamble is randomly selected by the MS from a plurality of orthogonal codes. For this embodiment, each of these orthogonal codes has a length of 2.sup.Nsig symbols, and is spread with a known base station-unique spreading code (i.e., spreading code number provided earlier via the base station's broadcast channel). The parameter, N.sub.sig, is the order number of the detected signature pattern. Each such symbol is spread by the same code sequence of length SF, where "SF" denotes the spreading factor of the code. Typically, the resulting length of the preamble (e.g., SF*2.sup.Nsig /R.sub.chip, where R.sub.chip is the chip rate or rate of the spreading sequence) is less than the length, N*T.sub.TS, of N frame slots in existing systems. Consequently, in accordance with the present invention, a guard time interval, T.sub.G, can be generated by interrupting the MS's transmission power from the end of the preamble to the beginning of the next frame slot. The time (or length) of the novel frame is thus represented in FIG. 4 as T.sub.PA (time or length of the preamble) plus T.sub.G (length of the guard time interval) plus T.sub.D (time or length of the data portion of the frame). This novel random access frame structure and method of use can reduce the MS's transmitted power (e.g., albeit slightly, by interrupting transmission during the interval between the preamble and data portion of the random access request), and the timing of the random access request can be aligned exactly to that of an existing system's frame slot scheme.

The above portions of Faber merely describe a method for keeping the closed loop adjustment of the transmission power of the mobile station in a CDMA mobile communication

system almost constant until the base station succeeds in decoding the first preamble frame without error, thus reducing interference by preventing transmission power overshoot.

In addition, the above portions of Gustafsson merely describe a frame structure with a separate preamble and data portion, wherein a guard interval is inserted between the preamble and data portion of the frame., which enables detection of the preamble before the data arrives (requiring less buffering).

However, even when combined, the combination of Faber and Gustafsson does not teach or suggest replacing at least a portion of a frame with an orthogonal code, determining a bit error rate for the orthogonal code in the frame transmitted by the wireless communications system, and adjusting transmit power in the wireless communications system based on the determined bit error rate.

Instead, the combination of Faber and Gustafsson would merely describe a frame structure with a preamble, guard interval and data, wherein power is reduced during the guard interval (Gustafsson), and otherwise held constant until the first preamble frame is decoded without error, and then incremented per predetermined period if a measured signal-to-interference ratio is greater than a first threshold, or if the present transmission power level is greater than a second threshold (Faber). However, such a combination does not render obvious Applicants' claims.

2. Claims 15-16 and 20-21 are Patentable over Kang and Chen

The Office Action asserts that the combination of Kang and Chen teaches the limitations of claims 15-16 and 20-21 at the following locations:

> Kang: Col. 5, lines 43-44
> If ACK is not received or NACK is received, the BTS or mobile station re-transmits the corresponding message.
>
> Kang: Col. 6, lines 41-47
> When the BSC receives a reverse erasure frame, the BSC confirms whether the PMRM message which includes the forward error rate count is higher than a specified level of the reverse erasure frame in the PMRM previously received, and if a forward error is higher than a specified level then the forward transmit power is increased, otherwise the present power control status of the BTS is maintained.
>
> Kang: Col. 6, line 66 – Col. 7, line 18
> FIG. 6 shows a flow chart illustrating a method for controlling forward power through changes in PMRM or Layer 2 Ack history according to the present invention. As illustrated in FIG. 6, the BSC determines whether there is at least one

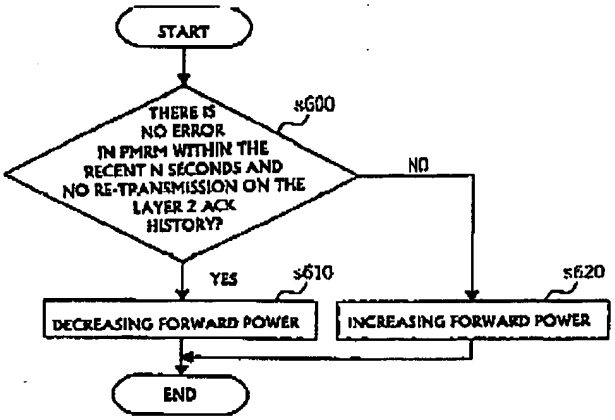
error in PMRMs received within the most recent N seconds and whether a message has been transmitted on the Layer 2 Ack history, at step 600.

Since the PMRM includes the forward frame error rate, the BSC confirms whether all frame error rates, which are included in those PMRMs received within the most recent N seconds, are less than or equal to a specific threshold. If all frame error rates included in the PMRMs received within the most recent N seconds, are less than or equal to a specific threshold, the BSC determines that no error occurred in the forward link within the recent N seconds.

If there is no error in the PMRMs received within the most recent N seconds and no message has been re-transmitted on the Layer 2 ACK History, the BSC orders the BTS to decrease the forward transmit power at step 610, otherwise, the forward transmit power is increased at step 620.

Kang: FIG. 6

FIG. 6




Chen: Col. 3, line 48 to col. 4, line 16

In accordance with the invention, a signal transmission power control system is provided with a means for transmitting signals initially at a pre-selected transmit power level; a means for successively, incrementally decreasing the transmit power level by a first amount; and a means for receiving a signal indicating that the transmit power level needs to be increased. The system also includes a means, responsive to receipt of the signals indicating that the transmit power level needs to be increased, for increasing the transmit power level and a means for decreasing the transmit power level by a second amount, greater than the first amount, following transmission of signals for a predetermined period of time without receipt of the signal indicating that the transmit power level needs to be increased. Hence, with this system, the transmit power level is incrementally decreased for some predetermined period of time. If no feedback signals indicating that the transmit power needs to be

increased are received during that period of time, then the system decreases the transmit power by a greater amount to achieve an immediate, greater amount of power reduction. In other words, a two-tiered power reduction scheme is employed.

By providing the foregoing two-tiered power reduction scheme, the average power required is typically reduced over that of the sawtooth feedback technique described above, particularly in circumstances where the minimum power requirements remain relatively low but are interspersed with occasional peaks of higher power requirements. In such circumstances, the two-tiered technique can provide significantly greater average power reduction than the aforementioned sawtooth technique. Hereinafter, the second sharper drop in transmit power provided by this two-tiered technique is also referred to as a "fast downward move" in the sense that a drop or move to a lower power transmission level occurs faster than the incremental power reduction of the aforementioned sawtooth technique.

Chen: Fig. 2

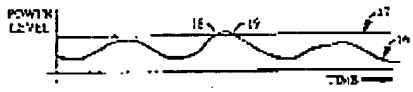


FIG. 2A

FIG. 2B

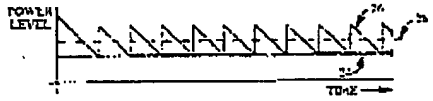


FIG. 2C

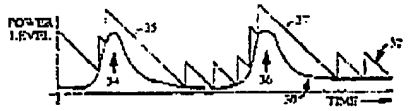


FIG. 2D

Chen: Fig. 3


FIG. 3A

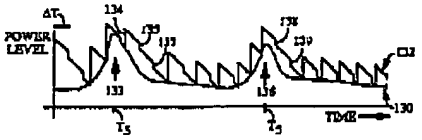



FIG. 3B

The above portions of Kang merely described controlling forward power based on forward frame error rates.

Further, the above portions of Chen merely describe a two-tiered power reduction scheme where the transmit power level is incrementally decreased for some predetermined period of time and, if no feedback signals indicating that the transmit power needs to be increased are received during that period of time, then the transmit power is decreased by a greater amount to achieve an immediate, greater amount of power reduction.

However, even when combined, Kang and Chen do not teach or suggest increasing transmit power for the re-transmission of a frame received in error, in accordance with the frame's position, in accordance with the amount of data transmitted, or by steps when one or more starting frames are received in error.

Instead, the combination of Kang and Chen would merely describe controlling forward power based on forward frame error rates using the indicated two-tiered power reduction scheme. However, such a combination does not render obvious Applicants' claims.

3. Claims 25, 27-29 and 31-32 are Patentable over the References

The Office Action asserts that the combination of Yoshida and Faber teaches the limitations of claims 25, 27-29 and 31-32 at the following locations:

Yoshida: Abstract

There is a data communication apparatus having a transmitting section to divide data into a plurality of units and transmit the data and a memory section to store the data. This apparatus reads out the data of the designated unit from the memory section in response to a retransmission request signal from the reception side and a signal indicative of the designated unit and then retransmits the readout data from the transmitting section. Thus, even if the transmission error occurs the data can be retransmitted from the corresponding line and the retransmission is efficiently executed.

Yoshida: Col. 7, lines 42-51

To accomplish this object, according to one aspect of the present invention, a data communication apparatus adapted to transmit and receive the data divided into a plurality of units comprises means for resending the code data corresponding the unit to the transmission side in the case where it is determined that the data in the unit has been erroneously received and then requesting the retransmission of the data in the unit, and means for variably setting the decision reference to request the retransmission of the data in the unit.

Yoshida: Col. 7, line 66 – col. 8, line 3

Still another object of the invention is to provide a data communication apparatus which can store a part of the transmitted data on the transmission side, thereby eliminating the problems which are caused due to the data transmission in accordance with the HDLC frame format.

Yoshida: Col. 10, lines 28-41

On the receiver side, the line number is checked when image data is being received, thereby discriminating whether a reception error has occurred or not. When the data was correctly received, the line number is removed and the image data is decoded. On the other hand, when the occurrence of the reception error was detected on the receiver side, the reception side apparatus transmits a control signal to interrupt the transmission of the image data from the apparatus on the transmission side. Thereafter, the reception side apparatus informs the retransmission request start line number to the transmission side apparatus. Thus, the transmission side apparatus restarts the transmission of the image data from the retransmission request start line number.

Faber: Col. 3, line 64 – col. 4, line 34

The present invention was developed in view of the above-described problems of the prior art and has the object of realizing a closed loop power control method that keeps the closed loop increment of the transmission power of the mobile station almost constant until the base station succeeds to decode the first preamble frame without error. Thus it reduces interference. According to an aspect of the present invention, there is a method of controlling power upon call acquisition in a CDMA mobile communication system for adjusting transmission power to a mobile station by sending a power control adjustment signal from a base station to the mobile station via a forward link, comprising the steps of:

(a) determining a signal-to-interference ratio and a maximum transmission power level respectively as predetermined first and second thresholds;

(b) indicating a given power increment per predetermined period;

(c) measuring a signal-to-interference ratio of a reverse link signal received from the mobile station, comparing the measured signal-to-interference ratio with the first threshold determined in said step (a), and comparing a present transmission power level with the second threshold determined in said step (a);

(d) not indicating the power increment per said predetermined period if said measured signal-to-interference ratio is greater than said first threshold in said step (c) or if said present transmission power level is greater than said second threshold in said step (c);

(e) indicating a further power increment per said predetermined period if said measured signal-to-interference ratio is smaller than said first threshold in said step (c) or if said present transmission power level is smaller than said second threshold in said step (c);

(f) after said step (d) or said step (e), confirming whether a preamble signal from the mobile station is normally decoded, and returning to said step (c) if the preamble signal is not normally decoded; and (g) starting a closed-loop power control algorithm if it is confirmed that the preamble signal is normally decoded in said step (f).

The above portions of Yoshida merely describe retransmitting lines of a facsimile image where it is determined that the data has been erroneously received,

In addition, the above portions of Faber merely describe a method for keeping the closed loop adjustment of the transmission power of the mobile station in a CDMA mobile communication system almost constant until the base station succeeds in decoding the first preamble frame without error, thus reducing interference by preventing transmission power overshoot.

However, even when combined, the combination of Yoshida and Faber does not teach or suggest determining whether a portion of a frame was received in error during a transmission in the wireless communications system, wherein the frame includes an indicator field comprised of a plurality of bits, each of the bits indicates parity for a corresponding portion of the frame, and one of the bits indicates a parity error for its corresponding portion of the frame, and invoking a re-transmission of only the portion of the frame received in error without invoking a re-transmission of the entire frame in the wireless communications system.

Instead, the combination of Yoshida and Faber would merely describe retransmitting lines of an image where it is determined that the data has been erroneously received, while using a closed loop adjustment of the transmission power that keeps the power constant until the first preamble

frame is decided without error. However, such a combination does not render obvious Applicants' claims.

4. Summary

In summary, the cited references do not anticipate or render obvious Applicants' claimed invention. Moreover, the various elements of Applicants' claimed invention together provide operational advantages over the references In addition, Applicants' invention solves problems not recognized by the references.

Thus, Applicants' attorney submits that independent claims 1, 8, 15, 20, 25, and 28 are allowable over the references. Further, dependent claims 2-7, 9-14, 16, 21, 27, 29 and 31-32 are submitted to be allowable over the references in the same manner, because they are dependent on independent claims 1, 8, 15, 20, 25, and 28, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-7, 9-14, 16, 21, 27, 29 and 30-32 recite additional novel elements not shown by the references.

III. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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